PROGRESS
OF
MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
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The Pupillary Symptoms in Thoracic Aneurysm.—In a clinical lecture Osler (*Practitioner*, 1910, lxxxiv, 417) showed a patient with a large aneurysm of the arch of the aorta, associated with unequal pupils and absent knee-jerks. In his discussion of the pupillary symptoms of thoracic aneurysm he recognized three groups of cases: In the first of these there is involvement of the sympathetic nerve by direct pressure of the aneurysmal sac. This is, however, rarely met with at postmortem examinations. Clinically, moreover, in most cases of aneurysm, pupillary features are present without other indications of involvement of the sympathetic system—such as unilateral flushing and sweating of the face, ptosis, and retraction of the eyeball. Dilatation of the pupil on one side may, however, be the sole indication of pressure on the sympathetic, and is sometimes met with in pneumonia, apical tuberculosis, and chronic pleurisy. Myosis with profuse sweating and occasional slight ptosis is more common than mydriasis with unilateral flushing, increased heat, and sweating. In the second class of cases the inequality of the pupils depends on the vascular condition of the iris. Wall and Walker believed that the most common cause of anisocoria is unequal blood pressure in the ophthalmic arteries. The vessels of the iris are spiral or zig-zag, and a rise of blood pressure tends to lengthen them and leads to a narrowing of the pupil, while a fall in pressure causes shortening of the vessels and enlargement of the pupil. The variations of pressure in the vessels of the iris do not correspond, however, to the variations in the radials, as the radial pulse may be larger on the side on which the pupil is smaller. In the third group is found the association of pupillary symptoms, aneurysm, and tabes—the Babinski syndrome—all a part of the syphilitic infection. In these cases the irregularity of the pupils or the myosis is not due to compression by the sac, but is the ocular manifestation of a tabetic or taboparetic state. The Babinski syndrome means merely a condition in which aneurysm is present along with tabetic features—the Argyll-Robertson pupil or unequal pupils, with absent knee-jerks or lightning pains.

The Quantitative Estimation of Albumin in the Urine.—Although the Esbach method is in wide use as the simplest means of quantitative estimation of albumin in the urine, its sources of error and inaccuracies are such as to make it of comparatively little value. In order that any degree of accuracy be obtained the urine must be diluted to a specific gravity of 1006 to 1008, and so that the albumin will read 4 grams or less to the liter, and the temperature should be at or near 15° C. The readings are frequently upset by the fact that the precipitate does not settle, or does not settle evenly, or by the percipitate forming immediately on mixing and thus interfering with the reading of the meniscus. As an improvement on the Esbach method, Tsuchiya has suggested the use of a solution of phosphotungstic acid, as follows: Phosphotungstic acid, 1.59 grams; hydrochloric acid (conct.), 5 c.c.; ethyl alcohol, q. s. ad 100 c.c. This solution is substituted for the picric-citric acid solution and is used in Esbach tubes. MATTICE (*Arch. Int. Med.*, 1910, v, 313) has made a comparative study of the value of this method, and of its modification by Goodman and Stern and the Esbach test, controlling his results by means of the gravimetric and Kjeldahl methods. The method of Goodman and Stern proved to be very inaccurate. Tsuchiya's method, however, gave extremely good results. The precipitate invariably settled more evenly and read closer to the weighings than it did with the Esbach. In a series of cases, readings made at room temperature showed that the average difference in albumin content as compared with the gravimetric and Kjeldahl method was 1.736 with the Esbach and only 0.297 with the Tsuchiya method. The phosphotungstic acid solution is lighter than water, and the urine need not be diluted. The presence of sugar in the urine is of little importance with the phosphotungstic acid. A slight precipitate with readings of 0.5 gram per liter and above in cases of nephritis in which the urine was examined daily showed very close relationship between the Kjeldahl and phosphotungstic acid methods, while the Esbach method proved quite unreliable.

The Relationship Between the Wassermann Reaction and Mercurial Treatment.—KIROLYFI (*Wien. klin. Woch.*, 1910, xxiii, 162) refers to the disappearance of a positive Wassermann reaction frequently noted during vigorous antiluetic treatment with mercury. Since it is not known whether this effect is due to the presence of mercury alone or to its action on one of the bodies concerned in the Wassermann reaction, the author has investigated the action of corrosive sublimate on the test in vitro and in vivo. The test-tube experiments confirmed the facts already noted by Detre and Sellei to the effect that relatively strong bichloride solutions cause no hemolysis of washed red blood cells, the corpuscles being fixed and sinking to the bottom of the tube. Weaker solutions cause laking of the red cells. The author found that laking occurred with solutions varying in strength between 0.003 to 0.004 per cent. and 0.04 to 0.06 per cent. When bichloride was added to the usual components of the Wassermann reaction, so that its resulting strength would fall within these limits, hemolysis took place, that is, a test which otherwise would have been positive became negative. It seemed probable, therefore, that the disappearance of a positive test during active mercurial therapy was due simply to the mercury in the patient's blood serum. In order to determine this point, luetic patients were studied before and during mercurial treatment. If the negative reaction during treatment is due to the mercury *per se* in the patient's serum, then the inactivated serum should cause hemolysis without the addition of hemolytic serum. As a matter of fact, hemolysis did occur. The interpretation of the result is complicated, however, by the fact that normal human serum contains amboceptors for sheep corpuscles. Therefore, it becomes necessary to remove the complement entirely from the experiment. When this is done, there is no hemolysis, showing that whatever mercury is present is quite inactive so far as hemolysis is concerned. This result indicates, the author believes, that mercury has a specific action on the luetic bodies in the patient's serum.

Experimental Anterior Poliomyelitis.—LEVADITI AND LANDSTEINER (*Compt.-rend. Soc. de biol.*, 1910, lxviii, 417) have continued their studies on poliomyelitis in monkeys by investigating the method of entrance of the virus into the system. The nasal mucous membrane of monkeys in captivity shows an inflammatory process, but this is most marked in infected animals—a fact which points to the possibility of the disease being spread from the nasal passage. To determine whether the nose might be the portal of entrance, a few drops of virus were injected into the nasal mucous membrane of a monkey. Ten days later the animal became paralyzed and died. To find out the path of the infection the two olfactory bulbs of this monkey were triturated with saline solutions and the mixture injected into another monkey. Six days afterward the second animal died. The organism thus probably enters the brain by following the branches of the olfactory nerve. With a view to finding some means of preventing infection by the nasal passages, virulent emulsions of virus were mixed with antiseptics—methylated oil, 1 per cent., and a powder of menthol, salol, and boric acid. Two hours later the mixtures were injected into the spinal cords of monkeys. These monkeys showed only slight, temporary disturbances, while the control animal, injected with the virus alone, became paralyzed on the fourth day and died.

The Results of Cutting the Tawara Bundles.—EPPINGER and ROTHBERGER (*Ztschr. f. klin. Med.*, 1910, lxx, 1) have made a study of the effects of severing the Tawara bundle in the living dog's heart. They find that the cutting of one of the Tawara bundles leads to a visible alteration in the contraction of the heart; the two chambers of the heart no longer beat synchronously, but alternate. Auscultation frequently gives a well-defined gallop rhythm. The most noticeable alteration is the change in the swing of the galvanometer needle (electrocardiograph). Severing the bundle does not necessarily lead to deleterious effects on the circulation. Provided there has not been much loss of blood, the heart beats with undiminished vigor for some time and the blood pressure is well maintained. The authors were not always successful in cutting the bundle, but in the cases in which the electrocardiogram showed no change, serial sections of the heart proved that the Tawara bundle had not been severed, while the positive cases always showed a lesion of the bundle. The authors have reproduced numerous electrocardiograms, which they discuss at considerable length. They show that the electrocardiogram assumes the form of right-sided extrasystoles when the left Tawara bundle is cut, and vice versa. This is explained by the fact that the right ventricle receives its normal stimulus from the auricle, whereas that to the left ventricle is interrupted by the cut in the Tawara bundle and only reaches it *via* the right ventricle. Furthermore, the result of bilateral cutting of the Tawara bundle brings proof of the physiological fact that the conduction of the simulus to the ventricles is conveyed exclusively by the Tawara bundles. Again, the negative results, where the cut missed the Tawara bundle, show that deep cuts elsewhere in the ventricle do not affect its contraction. The fact that automatism becomes established after cutting the Tawara bundles, just as it does after severing the bundle of His, indicates that the site of automatism may not be situated exclusively in the Tawara nuclei.

Chronic Heart Block in the Dog.—ERLANGER AND BLACKMAN (*Heart*, 1910, i, 177) report seven instances in which chronic heart block was produced in dogs by injuring the auriculoventricular bundle. Of five of these, all, possibly with one exception, had complete and permanent heart block lasting from six to three hundred and forty-three days. One animal had a relatively complete block from which it recovered in twenty-six days, and one had a slight grade of block which disappeared within forty-eight hours. The average ventricular rate was about 25, while that of the auricles was 129. The ratio of auricular to ventricular rate is thus just about the same as is found in heart block in man. The ventricular rate increased if the animal was nervous, after muscular exercise, but more especially during etherization. Various types of cardiac irregularity were met with. Periodic irregularities, variability of the ventricular rate, and ventricular extrasystoles were rare. More frequent were the periodic irregularities. In association with Cheyne-Stokes respiration, slowing of the ventricular rate occurred more or less synchronously with acceleration of the auricular and respiratory rates. Another type of arrhythmia consisted of periodic, although somewhat irregular, acceleration of the ventricles. The cause of this "group beating" of the ventricles is obscure, but after each series of rapid beats there occurred a stoppage of the ventricles, associated with which there might be vertigo and syncopal attacks similar to those seen in Adams-Stokes disease in man. In comparison to the body weight the heart was hypertrophied to as much as 100 per cent. In one instance the effect of stimulation of the vagus was studied, and it was found that a weak stimulus, but one sufficing practically to stop the auricles was almost without action on the ventricles, while the strongest stimulation only reduced the rate of the ventricles slightly. Stimulation of the accelerator nerve caused a greater proportional acceleration of the ventricles than of the auricles. In another case the injection of iodine solution into the region of the bundle caused at first a complete block, which later gave way to partial or, at times, a relatively complete block, and finally, after twenty-six days, resulted in a return to a normal conduction. Recovery was apparently due to decompression of the bundle through the removal of the iodine and of the inflammatory exudate. In no case was there any evidence of regeneration on the part of the conducting structures of the auriculoventricular bundle.

The Specific Meiostagmine Reaction.—Ascoli (*Münch. med. Woch.*, 1910, lvii, 62) has discovered a new and, as he believes, specific immunity reaction which he designates the meiostagmine reaction (μείων, small, and στάςω, to drop). The reaction depends upon alteration of the surface tension of an immune serum plus its specific antigen when tested before and after incubation in the thermostat. The apparatus used is the stalagmometer of Traube, by which the number of drops in a given quantity of fluid may be accurately determined. It was found that corrections for temperature need not be made, provided all determinations are made at room temperature. As a concrete example of the specificity of the meiostagmine reaction, Ascoli presents protocols of experiments performed with sera of typhoid fever patients which agglutinated typhoid bacilli in dilutions varying between 1 to 80 and 1 to 360. The serum was used in a dilution of 1 to 10. As antigen, the author employed the alcoholic extract of typhoid bacilli prepared according to the method of Neisser and Shiga (*Deutsch. med. Woch.*, 1905). The antigen was used in dilutions of 1 to 1000, 1 to 10,000, 1 to 100,000, and 1 to 1,000,000. As a diluent for both serum and antigen, 0.85 per cent. NaCl was used. To 9 c.c. of the diluted serum 1 c.c. of the diluted antigen is added, and the number of drops is immediately determined. The mixture is now placed in the incubator at 37° C. for two hours, removed, and allowed to cool to room temperature. A second determination of the drops is now made. When the antigen was employed in dilutions of 1 to 1000 to 1 to 100,000, the number of drops was always found to be increased by two to three after incubation, this result constituting a positive reaction. Normal sera, used as controls, when united with typhoid antigen, always gave negative results, that is there was no decrease in the size of the drops after remaining in the incubator two hours. Similarly, the substitution of colon bacillus extract as antigen with typhoid serum caused no lowering of the surface tension. The reaction probably depends at least, in part, on substances soluble in alcohol (lipoids), since the alcoholic precipitate, when used as antigen, gave negative results. The reaction shows, the author says, the importance of a more careful study of physicochemical processes in connection with immunity reactions.

The Meiostagmine Reaction in Malignant Tumors.—Ascoli and Izar (*Münch. med. Woch.*, 1910, lvii, 403) report a series of observations made on the blood of patients suffering with malignant tumors, with a view to determining the possibiility of applying the meiostagmine reaction in such conditions as a means of diagnosis. As controls, they used blood from patients suffering with various other diseases. Preliminary to their observations on human sera, they made a study of normal and sarcomatous rats. The preparation of the sarcomatous antigen is given in detail. Of 9 sarcomatous rats tested, all gave a positive meiostagmine reaction, while 8 normal rats reacted negatively. Using the sarcomatous antigen of the rat, they tested sera from patients and found a negative reaction in 28 cases which were non-malignant (including 2 lipomas), while 29 of 31 malignant tumors, among them 3 sarcomas, gave a positive reaction. (Most of the diagnoses were confirmed microscopically). Since then, the authors have prepared antigen from 6 different human carcinomas and find, to their surprise, that it must be used in very much more dilute solution (1 to 10,000) than was found to be advantageous with the rat antigen. In a footnote the authors state that their material now includes 62 cases of malignant disease, of whom 58 gave a positive meiostagmine reaction. In 48 non-malignant cases a positive reaction has not been encountered. Of the negative (non-malignant) cases, 2 leukemias were included. As yet, they have not had the opportunity of examining the blood of patients suffering with fibromas and myxomas.

A Specific Property of Luetic Sera.—Izar (*Münch. med. Woch.*, 1910, lvii, 182), working in Ascoli's laboratory, has applied the meiostagmin reaction, lately described by the latter, to the study of luetic sera. In all, his observations included twelve different sera, eleven of which yielded a positive Wassermann test. As antigen, the author made use of the alcoholic extract of a spleen obtained from a syphilitic fœtus. The organ was dried and rubbed up; 0.5 gram of the powder was shaken in 50 c.c. of alcohol, placed in the incubator two hours, filtered, and the filtrate condensed to 10 c.c. This stock solution of antigen was then diluted as necessary with 0.85 per cent. NaCl solution. For purposes of control, the luetic sera were united with various other antigens, namely, alcoholic extracts of organs showing tuberculosis, echinococcus, carcinoma, and sarcoma, and watery extract of typhoid. For further control, three sera from patients suffering with leprosy (two of which gave positive Wassermann reactions) were tested with all antigens. Dilutions of the luetic sera varied from 1 to 20 to 1 to 100 in 0.85 per cent. NaCl. For the antigen, the author found a dilution of 1 to 100 in 0.85 per cent. NaCl to be the best. To 9 c.c. of the diluted serum, 1 c.c. of diluted antigen was always added. The author's figures show that in all twelve sera the addition of syphilitic antigen caused an increase of two to five drops, whereas controls never showed an increase of more than one drop, usually only a fraction of a drop. When other antigens were used with the luetic sera, the increase in the number of drops after two hours in the incubator never exceeded one, showing apparently that the reaction is a specific one. The sera from the three patients with leprosy, as well as sera obtained from patients suffering with various other diseases, always reacted negatively. Especially noteworthy was the negative reaction in the case of the two leprosy sera which gave a positive Wassermann reaction.

These sera had been sent to the author simply as sera showing a positive Wassermann test. It was only after the negative meiostagmine test had been obtained that the author learned that the sera were not luetic in origin. Although the results obtained thus far are very encouraging, the author feels that the value of the method as a diagnostic aid is by no means proved with the small material he reports.

SURGERY.

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The Indications and Practical Value of Pyelotomy for the Removal of Calculi in the Renal Pelvis, Based Upon a Study of 103 Cases.—PERINEAU (*Ann. d. m. d. org. gén.-urin.*, 1910, 1, 493) considers that pyelotomy is an ideal operation for the radical cure of calculi of the pelvis and calices. It is scarcely more difficult than nephrotomy, which compels the delivery of the kidney. It permits a careful and complete exploration of the pelvis and calices by direct palpation. It avoids damage to the renal parenchyma, since there may be bilateral nephritis, especially marked in old cases. It avoids the possibility of primary or secondary hemorrhage, which has caused death in some cases, and permits catheterism of the ureter to determine its freedom from obstruction, which is essential to an uncomplicated cure. In all cases in which the ureter was clear healing occurred without a fistula. If in uncovering the kidney there is found an accentuated perinephritis preventing or rendering difficult the exposure of the ureter, the operation of pyelotomy should be abandoned. The lacerations and hemorrhage would make the operation a blind one and hazardous. The contra-indication is more marked in pyonephrosis. To expose the calculi and provide for drainage, it is much more rational to make a wide opening in the kidney, which may be the seat of a purulent collection. On the other hand, in cases of slight calculous pyelitis and perinephritis, pyelotomy is not contra-indicated. Then a more careful suture is required, in a double or triple layer. A renal calculus can be removed only by section of the parenchyma where it is enclosed. An attempt should never be made to remove a calculus requiring a large wound of the pelvis, and especially an incision invading the ureter. Every large stone invading the whole renal reservoir, which will be irregular and coral-shaped, ought to be removed by nephrotomy. Multiple, small calculi, according to the experiences of Delbet and Mocquot, should